What is Claimed is:

1. A method for measuring the agglomerative state of asphaltenes in oil containing asphaltenes, comprising applying to the oil a signal of acoustic energy, thereby scattering at least part of the energy; detecting the scattered acoustic energy over a selected frequency range; resolving the magnitude of the detected scattered acoustic energy at selected frequencies within the selected frequency range; and determining the agglomerative state of the asphaltenes.

2. A method as set forth in claim 1 wherein the selected frequencies within the selected frequency range comprise at least three different frequencies.

3. A method as set forth in claim 1 wherein the selected frequencies within the selected frequency range comprise at least fifteen different frequencies.

4. A method as set forth in claim 1 wherein the steps are carried out without diluting the hydrocarbon liquid.

5. A method as set forth in claim 4 wherein the steps of the method are carried out substantially instantaneously.

6. A method as set forth in claim 5, wherein the detected scattered acoustic energy is back-scattered acoustic energy.

7. A method as set forth in claim 6, wherein the selected frequency range is from about 0.1 MHz to about 20 MHz.

8. A method as set forth in claim 7, wherein the selected frequency range is from about 0.1 MHz to about 200 MHz.

9. A method as set forth in claim 8, wherein the selected frequency range is from about 14 MHz to about 20 MHz.

10. A method as set forth in claim 1, wherein the detecting is carried out by at least one sensor which sensor is incorporated in a signal input probe.

11. A method as set forth in claim 1, wherein the detecting is carried out by at least one sensor which sensor is separate from a signal input probe.

12. A method as set forth in claim 11, wherein the signal input probe and the sensor are located so that the signal direction of the probe intersects the signal direction of the sensor at an angle of less than about 90°.

13. A method as set forth in claim 12, wherein the signal input probe and the sensor are located so that the signal direction of the probe intersects the signal direction of the sensor at an angle of less than about 60°.

14. A method as set forth in claim 13, wherein the signal input probe and the sensor are located so that the signal direction of the probe intersects the signal direction of the sensor at an angle of less than about 45°.

15. A method as set forth in claim 1, wherein the signal of acoustic energy is applied as a pulse and the step of resolving the magnitude of the detected scattered acoustic energy at selected frequencies within the selected frequency range comprises gating the detected scattered acoustic energy to that part of the detected energy emanating from a focal region and Fourier transforming the detected scattered energy into a magnitude vs. frequency format.

16. A method as set forth in claim 1, wherein the signal of acoustic energy is applied as a tone-burst and the step of resolving the magnitude of the detected scattered acoustic energy at selected frequencies within the selected frequency range comprises detecting the magnitude of the scattered energy at selected frequencies within the selected frequency range.

17. A method as set forth in claim 1, wherein determining the agglomerative state of asphaltene particles having a size distribution is effected by comparing the size distribution of the asphaltene particles scattering acoustic energy within the selected frequency range with a standard.

18. A method as set forth in claim 17, wherein the standard is a sample of known particle size.

19. A method as set forth in claim 17, wherein the standard is a model of particle size based on scattering theory.

20. A method as set forth in claim 1, wherein the oil containing asphaltenes is in a process flow stream and the signal of acoustic energy is applied to the oil in the process flow stream.

21. A method for measuring the agglomerative state of asphaltenes in an oil containing asphaltenes comprising:

a. removing a sample of the oil and without diluting the oil;

b. applying to the oil a signal of acoustic energy, thereby scattering at least part of the energy;

c. detecting the magnitude of the scattered acoustic energy over a selected frequency range;

d. resolving the magnitude of the detected scattered acoustic energy at selected increments within the selected frequency range;

e. deriving from such resolution a distribution of the relative size of asphaltene particles scattering acoustic energy within the selected frequency range; and

f. determining the agglomerative state of the asphaltene particles.

22. A method as in claim 20, having the additional step of returning the undiluted oil sample.

23. A method as in claim 20, wherein the method is carried out in a benchscale device.

24. A method for controlling the agglomeration of asphaltenes in oil which comprises applying a signal of acoustic energy to the oil, thereby scattering at least a part of the energy; detecting the scattered energy over a selected frequency range; resolving the magnitude of the detected scattered energy at selected increments within the selected frequency range; comparing the resolved detected scattered energy with a standard; and acting to control the number of particles having a particle size corresponding to the selected incremental frequencies.

25. A method as set forth in claim 24, wherein the frequency range selected for detecting scattered acoustic energy is limited to a frequency range of acoustic energy scattered by the agglomerated asphaltene particles characteristic of the oil.

26. A method as set forth in claim 24, wherein the selected frequency range is from about 14 MHz to about 20 MHz.